

REMARKS

In the Office Action, the Examiner objected to claims 3, 8, 10, 13 and 21 for informalities. The Examiner provisionally rejected claims 1-5, 8-11, 13, 16-18 and 21 under the judicially created doctrine of obviousness type double patenting in view of United States Patent 6,826,737 B2. The Examiner provisionally rejected claims 1-5, 8-9, 11-13, 16-18 and 21-22 under the judicially created doctrine of obviousness type double patenting in view of United States Patent Application 09/731,891. The Examiner rejected claims 1-22 under 35 U.S.C. §112 as being indefinite. The Examiner rejected claims 1-7, 9, 11-12 and 14-15 under 35 U.S.C. §102(b) as being anticipated by United States Patent 5,673,201 to Malm, et al. (Malm). The Examiner rejected claims 1-7, 9, 11-12 and 14-21 under 35 U.S.C. §102(b) as being anticipated by United States Patent 4,615,011 to Linsker (Linsker). The Examiner rejected claims 1-7 and 9-22 under 35 U.S.C. §102(b) as being anticipated by United States Patent 5,822,214 to Rostoker, et al. (Rostoker).

In this Amendment, Applicants have amended claims 1, 3, 5-14, 16 and 18-21, but have not added or canceled any claim. Accordingly, claims 1-22 will be pending in the application after entry of this Amendment.

I. Objection to Claims 3, 8, 10, 13 and 21

In the Office Action, the Examiner objected to claims 3, 8, 10, 13 and 21 for informalities. Specifically the Examiner objected to the use of the same letters in claims 3, 8, 10 and 13 to denote further steps, as confusing. Applicants have amended these claims to remove the letter numbering. The Examiner objected to claim 8 for unclear antecedent basis. Applicants have amended claim 8 to recite "said wiring model specifies at least one diagonal wiring direction" and "A is an angle of said at least one diagonal wiring direction specified by the wiring model." The Examiner objected to claim 21 for the term "attributed" as confusing. Applicants

have amended claim 21 to recite "an attribute of the connection graph identified for the net" and to remove all letter numbering. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the objection to claims 3, 8, 10, 13 and 21.

II. Provisional Rejection of Claims 1-5, 8-13, 16-18 and 21-22

5 The Examiner provisionally rejected claims 1-5, 8-11, 13, 16-18 and 21 under obviousness type double patenting in view of United States Patent 6,826,737 B2. The Examiner provisionally rejected claims 1-5, 8-9, 11-13, 16-18 and 21-22 under obviousness type double patenting in view of United States Patent Application 09/731,891. Applicants have attached a Terminal Disclaimer, which obviates the provisional rejections. In view of the foregoing,
10 Applicants respectfully request reconsideration and withdrawal of the rejections under obviousness type double patenting.

III. Rejection of Claims 1-22 under §112

 In the Office Action, the Examiner rejected claims 1-22 under §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards
15 as the invention. Specifically, the Examiner stated that "during routing" is unclear in claims 1, 3, 5, and 12-13. Applicants have amended claims 1, 3, 5 and 12-13 to recite a method that places a net in a region of a circuit layout, for a routing operation, and that "before said routing operation" the method "accounts for potential diagonal wiring for said routing operation."

 The Examiner stated that the use of nets, circuit elements, and circuit modules is unclear
20 in claims 1, 3, 5 and 18. Applicants have amended claim 1 to recite a method of placing a net in a region of a circuit layout, and have amended several claims, including claims 3, 5, and 18, accordingly. Applicants have defined a net in the specification to include one or more circuit elements. Applicants have further defined a circuit element to include one or more circuit

modules and/or pins associated with these one or more circuit modules. For instance, Applicants respectfully direct the Examiner to page 29, line 14, of the specification, which states:

Figure 12 illustrates a cost-calculating process 1200 that computes the length of MST's that model the interconnect topologies of several nets. A placer
5 can use this process to generate a wirelength cost estimate for a set of nets on a net list. In some embodiments, the process 1200 starts whenever it receives a net list that specifies a number of nets.

Each received net has several circuit elements associated with it (*i.e.*, each net is defined to include several circuit elements). In other words, the nets on the
10 net list specify the interconnection between some or all the circuit elements in the IC layout. In the embodiments described below, the circuit elements associated with the nets are the pins of the circuit modules in the IC layout. Other embodiments, however, treat the circuit modules as the circuit elements of the nets. Some of these embodiments treat the circuit modules as the net circuit
15 elements and obviate the need to distinguish between the different pin locations, by assuming that the pins of each module are all located at uniform locations (*e.g.*, located at the origin of the modules).

The Examiner stated that the linear/non-linear relationships of what are not apparent in claims 6-7. Applicants have amended claim 6 to recite that "the delay cost has a linear
20 relationship to the net's wirelength cost" and claim 7 to recite that "the delay cost has a non linear relation ship to the net's wirelength cost."

The Examiner stated that the antecedent basis for "interconnect lines" is unclear in claim 10. As amended, claim 10 recites "a set of interconnect lines that traverse the identified set of sub-regions." Applicants respectfully submit that based on Applicants' definition of a net given

above, a sub-region may include a net (i.e., that includes a circuit element that includes a circuit module and or a pin), as well as interconnect lines that traverse the sub-region.

The Examiner stated that there is no antecedent basis for "placement metric" in claim 11. Applicants have amended claim 11 to recite "the placement cost is the cost of an initial
5 placement configuration."

The Examiner stated that there is no antecedent basis for "router's" in claim 12. Applicants have amended claim 12 to recite "a placer that does not account for potential diagonal wiring for said routing operation."

The Examiner stated that the relationship between nets and circuit modules has not been
10 established in claim 13. Applicants have amended claim 13 to recite "for a net in said circuit-layout region, said net comprising at least one circuit module, modifying a position of said circuit module."

The Examiner states that the use of a router in claim 14 is indefinite. Applicants have amended claim 14 to recite "the electronic design automation process includes said routing
15 operation, wherein said routing operation comprises a router that uses diagonal wiring to route the nets in the circuit-layout region."

The Examiner states that the "method for computing placement costs" is incomplete in claim 16. Applicants have amended claim 16 to recite "identifying a placement cost from said computed delay cost."

20 The Examiner states that the relationship between nets and circuit modules is unclear in claim 18. In light of the amendments to claims 1, 3 and 5 above, and in view of Applicants' specification, Applicants have amended claim 18 to recite "identifying the set of sub-regions that contains a net comprising said set of circuit elements."

In view of the foregoing amendments and discussion, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-22 under §112.

IV. Rejection of Claims 1-7 and 9-22 under §102(b)

The Examiner rejected claims 1-7, 9, 11-12 and 14-15 under §102(b) as being anticipated by Malm. The Examiner rejected claims 1-7, 9, 11-12 and 14-21 under §102(b) as being anticipated by Linsker. The Examiner rejected claims 1-7 and 9-22 under §102(b) as being anticipated by Rostoker. Claims 2-7 and 9-22 are dependent directly or indirectly on claim 1. Claim 1 recites for an electronic design automation process that uses a wiring model that includes diagonal wiring directions, a method that places a net in a region of a circuit layout. The placement is for a routing operation. The method, before the routing operation, selects a net from a plurality of nets in the region. For the selected net, the method computes a delay cost that accounts for potential diagonal wiring for the routing operation. The method identifies a placement cost from the computed delay cost.

Applicants respectfully submit that none of the cited references disclose, teach, or even suggest such a method. For instance neither Malm, nor Linsker, nor Rostoker, disclose, teach, or even suggest a method that, before a routing operation, selects a net from several nets in a region of a circuit layout and, for the selected net, computes a delay cost that accounts for potential diagonal wiring for the routing operation, and identifies a placement cost from the computed delay cost.

Accordingly, Applicants respectfully submit that the cited references do not anticipate or otherwise invalidate claims 1-7 and 9-22. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(b) rejection of claims 1-7 and 9-22.

CONCLUSION

In view of the foregoing, it is submitted that all claims, namely claims 1-22, are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

This Amendment is submitted with a petition and fee for a one month extension of time.

5 Accordingly, Applicants believe no additional fee is required. However, in the unlikely event that the Patent Office determines that additional fees, extension, and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or fees due in connection with the filing of this document, or to credit any overpayment, to Deposit Account: 50-1128
10 referencing docket: SPLX.P0124. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

STATTLER, JOHANSEN & ADELI LLP

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Andy T. Pho
Reg. No. 48,862

Stattler Johansen & Adeli LLP
1875 Century Park East, Suite 1050
Century City, CA 90067
Phone: (310) 785-0140 x303
Fax: (310) 785-9558